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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant: Eric D. Morrison, et al. Examiner: Callie Shosho  
Serial No. 10/010,926 Group Art Unit: 1714  
Filed: November 09, 2001 Docket No. 456.003US1  
Title: LIQUID INKS COMPRISING TREATED COLORANT PIGMENTS

**MAIL STOP APPEAL BRIEF - PATENTS**

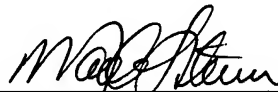
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**The following documents are hereby submitted:**

- ☒ Appeal Brief to the Board of Patent Appeals and Interferences of the United States Patent and Trademark Office (three copies)
- ☒ Authorization to withdraw \$330.00 to cover Appeal Brief Fee
- ☒ Transmittal Sheet
- ☒ Return postcard

**Please consider this a PETITION FOR EXTENSION OF TIME for sufficient number of months to enter these papers if an additional extension of time is deemed necessary by the Office. Authorization is hereby given to charge Deposit Account Number 50-1391 if such additional extension is necessary.**

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By:   
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CERTIFICATE UNDER 37 C.F.R. 1.8: The undersigned hereby certifies that this Transmittal Letter and the paper, as described herein, are being deposited in the United States Postal Service, as first class mail, with sufficient postage, in an envelope addressed to: Mail Stop Appeal Brief - Patents, Commissioner for Patents, PO Box 1450, Alexandria, VA 22313-1450 on 17 May 2004

Mark A. Litman  
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Signature



BRIEF ON APPEAL  
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Title: LIQUID INKS COMPRISING TREATED COLORANT PIGMENTS

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Docket No.: 456.003US1

**S/N 10/010,926**

**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**  
**BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

Applicant:	Eric D. Morrison, et al.	Examiner:	Callie E. Shosho
Serial No.	10/010,926	Group Art Unit:	1714
Filed:	November 09, 2001	Docket No.	456.003US1
Title:	LIQUID INKS COMPRISING TREATED COLORANT PIGMENTS		

**MAIL STOP: APPEAL BRIEF - PATENTS**

P.O. BOX 1450  
Commissioner for Patents  
Alexandria, VA22313-1450

Sir:

**Please consider this APPEAL BRIEF as including a Petition for a Two-Month Extension of time and for the fees for that Petition and all other charges, fees and costs to be debited to Attorney's Deposit Account No. 501391.**

This Brief is being filed in triplicate along with authorization to debit \$330.00 to Deposit Account No. 50-1391 to cover the fee for the appeal as a Large Entity.

Appellants request the opportunity for a personal appearance before the Board of Appeals to argue the issues of this appeal. The fee for the personal appearance will be timely paid upon receipt of the Examiner's Answer.

CERTIFICATE UNDER 37 C.F.R. 1.8: The undersigned hereby certifies that this Transmittal Letter and the paper, as described herein, are being deposited in the United States Postal Service, as first class mail, with sufficient postage, in an envelope addressed to: MAIL STOP: APPEAL BRIEF - PATENTS, P.O. BOX 1450, Commissioner for Patents, Alexandria, VA 22313-1450 MAY 17, 2004.

Mark A. Litman  
Name

Signature

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**REAL PARTY IN INTEREST**

The real party in interest in this Appeal is the assignee of the full right, title and interest in this Application, Samsung Information Systems of America, having a place of business at 2101 Wooddale Drive, Woodbury, Minnesota 55125.

**RELATED APPEALS AND INTERFERENCES**

The Appellant(s), the legal representative prosecuting this application and Appeal, and the assignee are not aware of any Appeals or Interferences that will directly affect or have a bearing on the Board's of Patent Appeals and Interferences decision in this pending Appeal.

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**STATUS OF CLAIMS**

Claims 6, 8 and 10 have been allowed.

Claims 1, 3-5 and 11-16 have been rejected.

Claims 2, 7 and 9 have been cancelled.

**STATUS OF AMENDMENTS**

An Amendment under 37 C.F.R. 1.116 was filed on 16 March 2004, but entry was refused. The proposed amendments attempted to clarify a portion of the specification and a limitation in claim 15. The Appeal will proceed without consideration of those Amendments, as they affect only claim 15.

### **ISSUES**

1. Claim 15 has been rejected under 35 USC 112, second paragraph as ambiguous with respect to the antecedent basis for the term "polymer."
2. Claims 1, 3-5, 11-14 and 16 have been rejected under 35 USC 103(a) as unpatentable over Uytterhoeven et al. (US Patent No. 4,663,265) in view of Baker et al. (US Patent No. 5,698,616).



### **GROUPING OF CLAIMS**

Solely for the purposes of expediting this Appeal and complying with the requirements of 37 C.F.R. 1.192(c)(7), the following grouping of claims is presented. This grouping is not intended to constitute any admission on the record that claims within groups may or may not be independently asserted in subsequent litigation or that for any judicial determination other than this Appeal, the claims may or may not stand by themselves against any challenge to their validity or enforceability. Grouping shall be proposed under each ground of rejection, and groupings will not carry over into multiple grounds of rejection unless specifically stated by Appellants.

1. Claim 15 has been rejected under 35 USC 112, second paragraph as ambiguous with respect to the antecedent basis for the term "polymer."

Claim 15 shall stand or fall by itself under this ground of rejection.

2. Claims 1, 3-5, 11-14 and 16 have been rejected under 35 USC 103(a) as unpatentable over Uytterhoeven et al. (US Patent No. 4,663,265) in view of Baker et al. (US Patent No. 5,698,616).

Claims 1, 3-5, 11-14 and 16 shall stand or fall with the patentability of claim 1 under this ground of rejection.

### **ARGUMENT**

1. Claim 15 has been rejected under 35 USC 112, second paragraph as ambiguous with respect to the antecedent basis for the term "polymer."

Claim 15 shall stand or fall by itself under this ground of rejection.

Because of the inability of Appellants to amend claim 15, this ground of rejection cannot be argued against. Appellants therefore concede that claim 15 is unpatentable for the reasons in the rejection.

2. Claims 1, 3-5, 11-14 and 16 have been rejected under 35 USC 103(a) as unpatentable over Uytterhoeven et al. (US Patent No. 4,663,265) in view of Baker et al. (US Patent No. 5,698,616).

Claims 1, 3-5, 11-14 and 16 shall stand or fall with the patentability of claim 1 under this ground of rejection.

### **Preliminary Remarks**

A brief description of the present invention in terms of the performance of the materials is thought to be desirable to establish a uniform background for identifying those features of the present invention distinguishing the claimed invention from the prior art.

It was found by Appellants that the stability and performance of liquid electrophotographic toners or inks could be substantially improved. The basis of the problem solved by Appellants was that the toner particles in the ink were unstable and would not form images with maximum possible image densities. The invention found that a pre-treatment of the colorant particles with a first coating resin having a specific range of properties, and then the dispersion of those treated particles in an organosol with a second resin with a different set of properties enhanced the performance of the liquid inks in the electrophotographic process. The important aspect of the invention is the fact

that a first resin coats the colorant particles and then the coated particles are dispersed in an organosol with a second and different resin. The use of two resins, one as a particle coating and the other as the organosol binder, and their specific difference in properties act in concert to provide the benefits of the invention. Without the specific differences in properties and their combination with the specific properties associated uniquely with the colorant coating and the organosol binder, the benefits of the invention will not be obtained.

To identify these features, the limitations in amended claim 1 will be pointed out with specificity:

1. (PREVIOUSLY AMENDED) A process of making a liquid ink comprising the steps of:
  - (a) dissolving a first polymer comprising units derived from at least a nitrogen-containing polymerizable monomer in a solvent with a Kauri-Butanol number greater than 30 to form a polymer solution, wherein said nitrogen atom is present in a functional group selected from the group consisting of amine groups;
  - (b) dispersing colorant pigment particles in said polymer solution to form a colorant pigment dispersion;
  - (c) removing at least some of said solvent from said colorant pigment dispersion to form treated colorant pigment particles with an outer layer of the first polymer; and
  - (d) dispersing said treated colorant pigment particles in an organosol containing a second polymer carried in a carrier liquid having a Kauri-Butanol number less than 30.

Note that as originally filed and claimed, and as merely emphasized by the amendment (substantively limiting the claim only with respect to the fact that the first polymer treatment is a coating), the first polymer is insoluble in the carrier liquid but soluble in liquids having a Kauri-Butanol number greater than 30). This pigment surface treating

polymer comprises units derived from at least a nitrogen-containing polymerizable monomer, wherein said nitrogen atom is present in a functional group selected from an amine group (e.g., consisting of primary, secondary, tertiary and quaternary amine groups). The second polymer, contained in the organosol, is dispersed or suspended in the carrier liquid, which has a Kauri-Butanol number less than 30. **This combination of properties in the specific order and location recited is the feature that is absent from the teachings in some references used in the rejections as specifically pointed out in the discussion of the rejections.**

Claims 1, 3-5, 11-14 and 16 have been rejected under 35 USC 103(a) as unpatentable over Uytterhoeven et al. (US Patent No. 4,663,265) in view of Baker et al. (US Patent No. 5,698,616).

The rejection of these claims is traversed. The Office Action has asserted that Uytterhoeven does not disclose reacting polymers, and does not require the reaction of the materials. **THAT ASSERTION IN THE REJECTION IS CLEARLY IN ERROR, and although attempting to mitigate the import of this fact in the ASdvisory Action mailed April 2, 2004, the admission is fatal to the rejection.** The basic problem with this rejection is the unique requirement of Uytterhoeven that the two polymeric materials are “chemically reacted” (column 10, lines 5-20 and 33-38). The language “reacted polymers A and B” clearly requires and discloses reaction of the diverse materials. This requirement in the practice of the Uytterhoeven invention absolutely excludes the possibility of the recitations in the claims of:

“(c) removing at least some of said solvent from said colorant pigment dispersion to form treated colorant pigment particles with an outer layer of the first polymer; and

(d) dispersing said treated colorant pigment particles in an organosol containing a second polymer carried in a carrier liquid having a Kauri-Butanol number less than 30.

Look for example at step 3 of Examples 4, 14 and 15 of Uytterhoeven:

“Step (3): 4.4 g of the copolymer of stearyl methacrylate and dimethylaminoethyl methacrylate (polymer B) prepared according to preparation 2 were dissolved in 500 ml of isododecane. To the obtained solution of polymer B the above prepared dispersion containing said polymer A was added portionwise in a high speed mixer and ultrasound was used intermittently over a period of 30 minutes. After the addition the mixture was stirred for still 30 minutes to have the reaction of polymer A with polymer B completed.” (Example 4 of Uytterhoeven, Emphasis added)

“In step (3) a polymer B was used prepared according to preparation 4. 5.64 g of polymer B were dissolved in 500 ml of isododecane and allowed to react with polymer A forming a pre-coating on the carbon black particles.” (Example 14 of Uytterhoeven, Emphasis added)

“Step (3): 12 g of the copolymer of stearyl methacrylate and dimethylaminoethyl methacrylate (polymer B) prepared according to preparation 2 were dissolved in 500 ml of isododecane. To the obtained solution containing polymer B the above prepared dispersion containing said polymer A was added portionwise in a high speed mixer and ultrasound was used intermittently over a period of 30 minutes. After the addition the mixture was stirred for another hour at 80°C. to have the reaction of polymer A with polymer B practically completed.” (Emphasis added)

It is therefore absolutely clear that Uytterhoeven discloses, teaches and requires the reaction of polymers A and B in the practice of that invention. The formation of the reacted coating on the pigment (carbon black in the examples) absolute excludes the formation of the materials and the practices of the process recited in claim 1 of:

- (c) removing at least some of said solvent from said colorant pigment dispersion to form treated colorant pigment particles with an outer layer of the first polymer; and
- (d) dispersing said treated colorant pigment particles in an organosol containing a second polymer carried in a carrier liquid having a Kauri-Butanol number less than 30.

There is no dispersion formed and there is no dispersing effected when the polymers are reacted. In Uytterhoeven, a coated particle is formed, with the coating being the product of the Polymers A and B. There is no dispersion of a particle coated with A in an organosol containing polymer B carried in the carrier liquid. The requirements of Uytterhoeven and the teachings of the entire specification of Uytterhoeven specifically exclude the practice of those limitations.

In the present invention, there is no requirement or teaching that the nitrogen-containing polymer used to treat the pigment surface be chemically reacted with the second polymer contained in the organosol. Indeed, because the present invention involves treating the surface of the pigment with a nitrogen-containing polymer dissolved in a solvent having a Kauri-Butanol number  $> 30$  (e.g. carrier liquid insoluble) in a first step, and then combining this treated pigment with a second polymer dispersed in a carrier liquid having a Kauri-Butanol number  $< 30$  in a second step, there is no reason to react the materials, and extreme effort (in a cross-phase or phase interface reaction) would have to be performed intentionally to chemically react the two distinct polymers,

which have mutually incompatible carrier solvents. Furthermore, the claim recites dispersing the coated polymer in an organosol with the second polymer therein. This excludes reacting a second polymer with a first polymer and pigment. To be dispersed excludes the reaction of the two polymers into a single chemical component.

Moreover, whereas Baker et al. teach a copolymer used to disperse a pigment in a carrier liquid, the copolymer of Baker et al. is itself a graft copolymer formed by chemically reacting a polymer (graft stabilizer) soluble in the carrier liquid (i.e. Kauri-Butanol number < 30) with a monomer (which may be derived from amino-functional groups) which polymerizes to form a carrier liquid insoluble core (i.e., soluble in a liquid with Kauri-Butanol number > 30). This graft copolymer is dispersed in the carrier liquid and combined with a pigment to produce a liquid toner. However, this polymer, formed by chemically reacting the graft stabilizer and the core, is not itself soluble in liquids having a Kauri-Butanol number > 30, and would thus be unsuitable for the treatment of pigments as described in the present invention. It is therefore impossible to assert that it is obvious to combine the two references without destroying the function of the Uytterhoeven composition to make the coated pigment particles as taught by the present invention and as recited in the claims.

In addition, because the Baker et al. reference inherently teaches improvements in the sedimentation and aggregation stability of pigments by combining the pigment with an organosol, and Uytterhoeven et al. is directed at itself improving the dispersability and aggregation stability of pigment dispersions in aliphatic carrier liquids, the motivation to combine the Uytterhoeven and Baker et al. references does not exist. Either reference alone teaches an adequate and independent basis for stabilizing the pigment dispersion with respect to aggregation and sedimentation in aliphatic carrier liquids. Attempting to combine the two techniques would be difficult. The rejection is in error and must be reversed.

The rejection is clearly insufficient and must be reversed.

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**CONCLUSION**

All rejections of record have been shown in detail to be in error. The rejection should be reversed and all claims should be indicated as allowable.

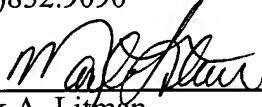
Applicants believe the claims are in condition for allowance and request reconsideration of the application and allowance of the claims. The Examiner is invited to telephone the below-signed attorney at 952-832-9090 to discuss any questions that may remain with respect to the present application.

Respectfully submitted,  
INVENTOR NAMES

By their Representatives,  
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Date MAY 15, 2004

By

  
Mark A. Litman  
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I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to Box: APPEAL BRIEF - PATENTS, P.O. BOX 1450; Commissioner for Patents, Alexandria, VA 22313-1450 on MAY 17, 2004.

Name: Mark A. Litman

  
Signature



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**APPENDIX - THE CLAIMS ON APPEAL**

1. (PREVIOUSLY AMENDED) A process of making a liquid ink comprising the steps of:

(a) dissolving a first polymer comprising units derived from at least a nitrogen-containing polymerizable monomer in a solvent with a Kauri-Butanol number greater than 30 to form a polymer solution, wherein said nitrogen atom is present in a functional group selected from the group consisting of amine groups;

(b) dispersing colorant pigment particles in said polymer solution to form a colorant pigment dispersion;

(e) removing at least some of said solvent from said colorant pigment dispersion to form treated colorant pigment particles with an outer layer of the first polymer; and

(d) dispersing said treated colorant pigment particles in an organosol containing a second polymer carried in a carrier liquid having a Kauri-Butanol number less than 30.

2. (CANCELLED)

3. (ORIGINAL) A process of making a liquid ink according to claim 1 wherein the dispersion resulting from step b) further comprises a charge director

4. (PREVIOUSLY AMENDED) A process of making a liquid ink according to claim 1 wherein said nitrogen-containing polymerizable monomer is selected from the group consisting of methacrylates or acrylates having aliphatic amino radicals, nitrogen containing heterocyclic vinyl monomers, aromatic substituted ethylene

monomers containing nitrogen radicals, and nitrogen-containing vinyl ether monomers.

5. (ORIGINAL) A process of making a liquid ink according to claim 1 wherein the colorant pigment is carbon black.

6. (PREVIOUSLY AMENDED) A process of making a liquid ink comprising the steps of:

(a) dissolving a first polymer comprising units derived from at least a nitrogen-containing polymerizable monomer in a solvent with a Kauri-Butanol number greater than 30 to form a polymer solution, wherein said nitrogen atom is present in a group selected from the group consisting of amine groups;

(b) dispersing colorant pigment particles in said polymer solution to form a colorant pigment dispersion;

(c) precipitating treated colorant pigment particles from said colorant pigment dispersion, the treated colorant pigment comprising pigment with said first polymer precipitated thereon; and

(d) dispersing said treated colorant pigment particles in an organosol containing a second polymer suspended in a carrier liquid having a Kauri-Butanol number less than 30.

7. (CANCELLED)

8. (ORIGINAL) A process of making a liquid ink according to claim 6 wherein the dispersion formed in step b) further comprises a charge director.

9. (CANCELLED).

10. (ORIGINAL) A process of making a liquid ink according to claim 6 wherein the colorant pigment is carbon black.

11. (PREVIOUSLY AMENDED) A liquid ink comprising:

- (a) a carrier liquid having a Kauri-Butanol number less than 30;
- (b) an organosol carrying a first polymer; and
- (c) colorant pigment particles surface-treated by a second polymer soluble in a solvent having a Kauri-Butanol number greater than 30 and comprising units derived from at least a nitrogen-containing polymerizable monomer, wherein said nitrogen atom is present in a functional group selected from the group consisting of amine groups.

12. (ORIGINAL) The liquid ink of claim 11 wherein the surface-treated particle is surface-treated by application of a coating or chemical modification of the surface.

13. (ORIGINAL) A liquid ink according to claim 11 wherein said liquid ink further comprises a charge director.

14. (PREVIOUSLY AMENDED) A liquid ink according to claim 11 wherein said nitrogen-containing polymerizable monomer is selected from the group consisting of methacrylates or acrylates having aliphatic amino radicals, nitrogen containing heterocyclic vinyl monomers, aromatic substituted ethylene monomers containing nitrogen radicals, and nitrogen-containing vinyl ether monomers.

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15. (AMENDMENT REFUSED) A liquid ink according to claim 11 wherein said first polymer has a weight average molecular weight between 50,000 and 150,000 Daltons.

16. (ORIGINAL) A liquid ink according to claim 11 wherein said colorant pigment is carbon black.